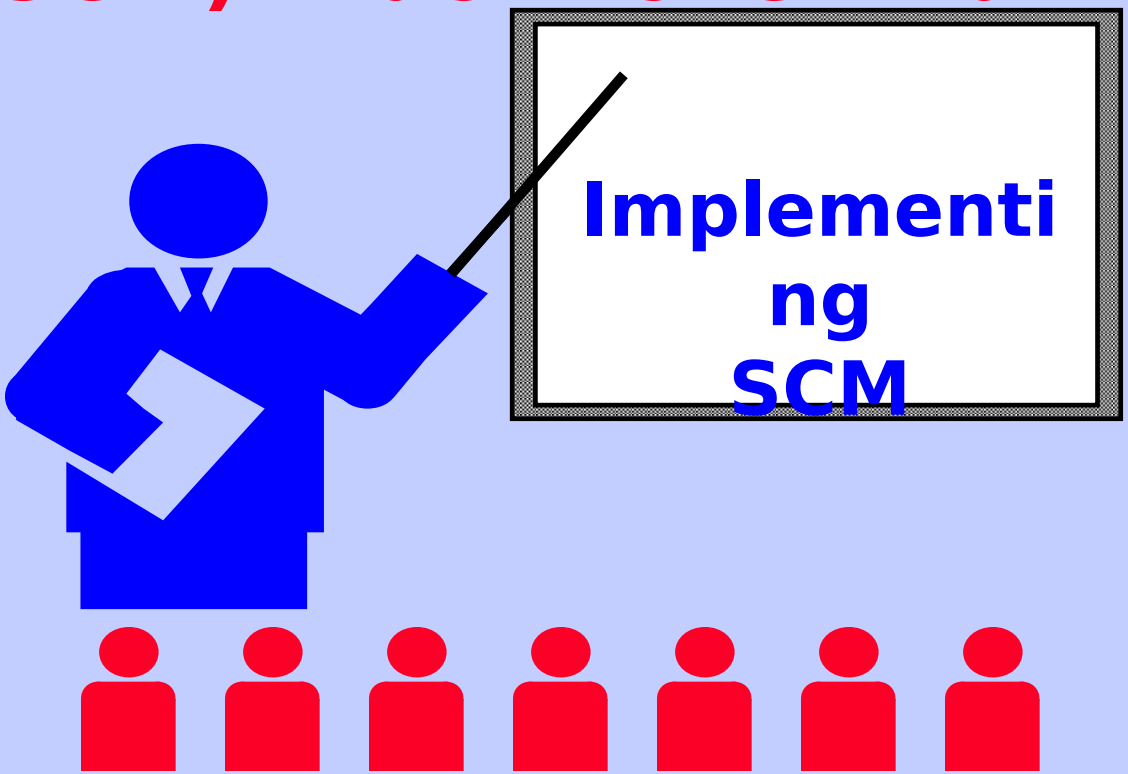
Software Configuration Management (SCM) Practitioner Training



Objectives

Part 1: Overview of SCM (taught separately)

- Why SCM?
  - Purpose
  - Importance
- Overview of Major SCM Activities
  - Identification
  - Baselining and change control
  - Status accounting
  - Audits
- Resources at SSC-San Diego for implementing SCM

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Part 2: Practitioners' Training

- **Implementing SCM**
  - **Applying the SCM Process**
  - **Creating and Implementing SCM Plans and Procedures**

Implementing SCM:
Applying the SCM Process

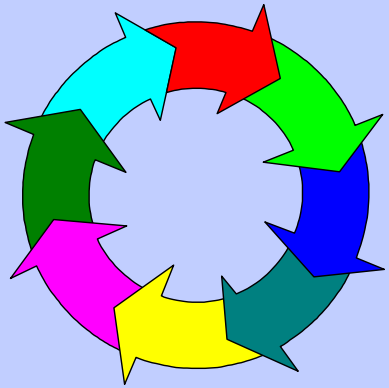
TASKS:

MANAGING SCM

- Create and maintain project SCMP
- Manage implementation of SCMP
- Provide SCM training

IMPLEMENTING SCM

- Perform configuration identification
- Perform configuration control
- Perform configuration status accounting (CSA)
- Perform configuration audits and reviews



SCM Expert Mode (1 of 3)

PRX-SCM-01 v1.0 Software Configuration Management (Expert Mode)
10/30/01

Process: Software Configuration Management (SCM)

Phase: Global

Process Owner: SSC San Diego SEPO

Description: SCM establishes and maintains the integrity of the products of a software project throughout the software life cycle. SCM involves identifying the configuration of products that are delivered to the customer and used in development, systematically controlling changes to the configuration, and maintaining the integrity and traceability of the configuration.

Entry Criteria/Inputs:

- Technical data: specifications, requirements, designs, code, documentation
- Programmatic data: project plans and schedules (e.g., Software Development Plan); reports; review results
- Change requests (CRs)
- Resources and training for the SCM process

Exit Criteria/Outputs:

- SCM Plan (SCMP)
- SCM Desktop Procedures (DTPs)
- SCM review, and audit reports
- Personnel trained in SCM
- Products baselined and controlled

SCM Expert Mode (2 of 3)

Roles:

- Project Manager (PM): appoints and oversees SCM organization
- SCM Manager(SCMM), if appointed: leads SCM group
- SCM Group: team of individual SCM practitioners who implement this process
- Software Configuration Control Board (SCCB): evaluates and makes decisions that affect baselines
- Senior Management: periodically reviews SCM activities
- Software Quality Assurance (SQA): audits products and SCM activities

Assets/References:

a. SSC San Diego SCM Policy, at http://sepo.spawar.navy.mil/ under SCM KPA

b. (NAVAIR) SCM Process Definition, at http://sepo.spawar.navy.mil/ under SCM KPA

c. (NAVAIR) Generic SCM Plan, at http://sepo.spawar.navy.mil/ under SCM KPA

d. IEEE/EIA 12207.0, Software Life Cycle Processes, Clause 6.2: Configuration management process

e. IEEE Standard 1042, IEEE Guide to Software Configuration Management

f. Capability Maturity Model for Software (SW-CMM), SCM Key Process Area (KPA)

g. MIL-STD-498: Software Development and Documentation (cancelled

SCM Expert Mode (3 of 3)

Tasks: consist of *Managing SCM* (tasks 1-3) and *Performing SCM* (tasks 4-7)

1. Create and maintain project SCMP
2. Manage implementation of SCMP
3. Provide SCM training
4. Perform configuration identification
5. Perform configuration control
6. Perform configuration status accounting (CSA)
7. Perform configuration audits and reviews

Measures:

- Effort and funds expended for SCM tasks

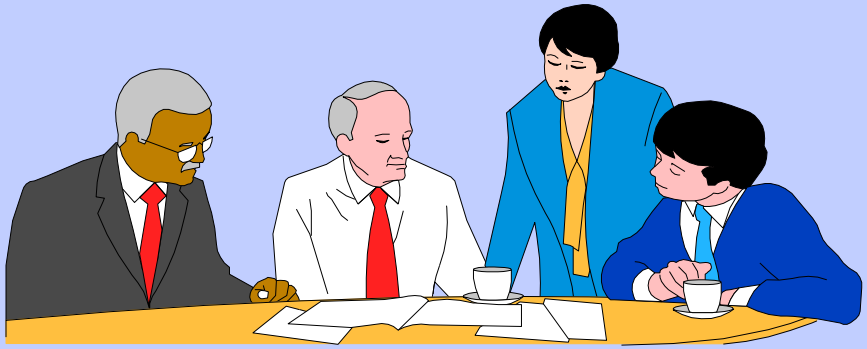
PROCESS TASKS …

(details addressed in upcoming viewgraphs)

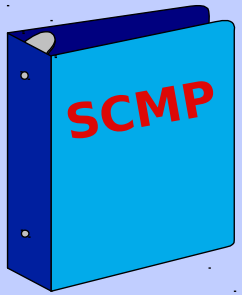
Create and Maintain the SCMP

Purpose of the SCMP:

- **Ensure that all SCM activities are identified, assigned and planned**
- **Define and document how SCM will be implemented**
- **NOTE: If starting the project, ensure acceptance by the project team prior to the start of software development**



The SCMP



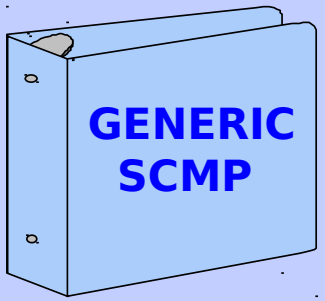
To Create the SCMP:

- Use Generic SCMP* (a Level 2 AND Level 3 requirement!) as the plan template and tailor specific to project requirements
  - DO Tailor Roles and Responsibilities, Document/Report Formats, task phasing
  - DO NOT "Tailor Out" the Intent, Goals and Objectives of SCM!
- If project SCMP exists, check SCMP against Generic SCMP to help identify SCM activities that are missing or need improvement

* location: SCM KPA on the Org. PAL - http://sepo.spawar.navy.mil

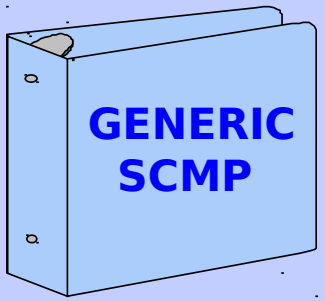
The Generic SCMP

- Based on MIL-STD-973, compliant with EIA-649, the consensus standard for Configuration Management
- Tailor template to project requirements
- Easy to Use
  - MS Word format
  - Document Template Conventions
    - » [[text]] - global changes
    - » Courier font - change on an individual basis
    - » italics - instructions and explanations



Outline of the SCMP

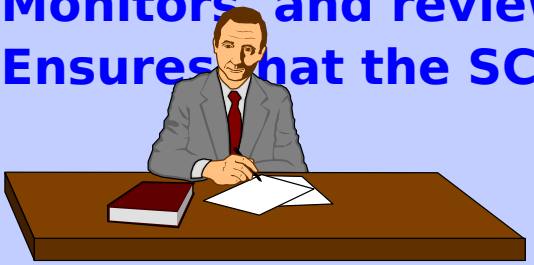
Section 1. Introduction
Section 2. Reference Documents
Section 3. Organization
Section 4. Configuration Management Phasing and Milestones
Section 5. Data Management
Section 6. Configuration Identification
Section 7. Interface Management
Section 8. Configuration Control
Section 9. Configuration Status Accounting
Section 10. Configuration Audits
Section 11. Subcontractor/Vendor Control

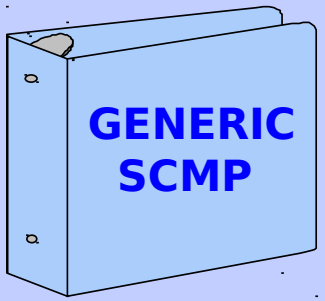


Role of Project Management in SCM

Responsibilities:

- Oversees complete fulfillment of all program requirements
- Oversees acquisition, funding and transitioning of projects
- Chairs Configuration Control Board for Class I changes
- Obtains local funding
- Allocates project resources (i.e. SCM resources)
- Develops schedules
- Assigns tasking
- Reports to program management
- Monitors and reviews SCM activities
- Ensures that the SCMP is developed

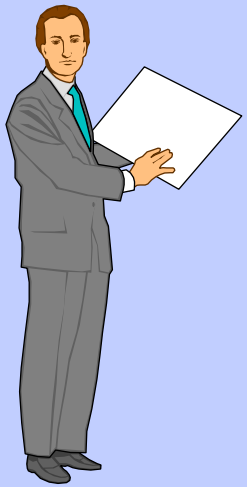


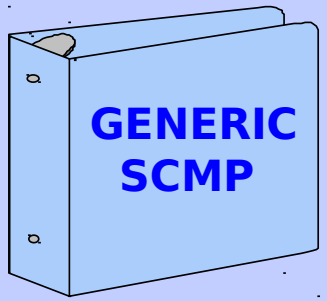


Role of Software Systems Engineering in SCM

Responsibilities:

- Participates in SCCB
- Participates in Interface Control Working Group (ICWG)
- Develops products that are placed under SCM:
  - » Overview and guidance for system design and associated documentation
  - » Detailed design and coding
  - » Test plans, procedures, and reports
  - » Software unit tests
  - » Preliminary CSCI tests

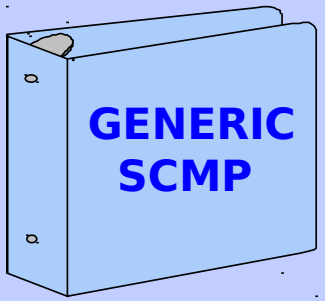




Role of Software Designers and Developers on SCM

Responsibilities:

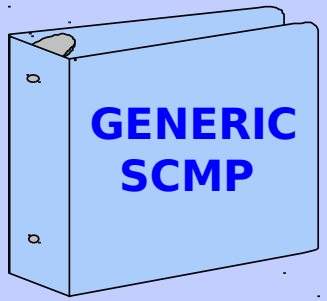
- Participate in SCCB
- Participate in ICWG
- Develop products that are placed under CM:
  - Overview and guidance for software design and associated documentation
  - Detailed design and coding
  - Test plans, procedures, and reports
  - Software unit tests
  - Preliminary CSCI tests



Role of Software Testers in SCM

Responsibilities:

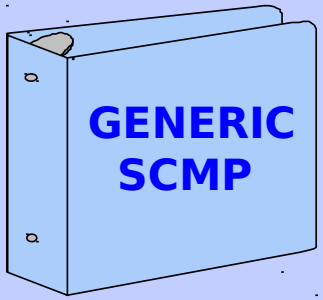
- Participate in SCCB
- Confer with SCM to incorporate approved changes into test documentation
- Develop products that are placed under CM:
  - » Test plan, description, procedures, and reports
  - » Descriptions of test environment configurations used
  - » List of verified change requests included in an Engineering Master that is to be tested
  - » Test reports
  - » Documented evaluation of impact of potential changes on testing



Role of SQA and System Testers in SCM

- **Software Quality Assurance (SQA) responsibilities:**
  - **Audit the software development activities and product, i.e., Functional Configuration Audits (FCA) and Physical Configuration Audits (PCA)**
  - **Certify SCM compliance with SCMP and desktop procedures.**
  - **Participate in the SCCB and ICWG**

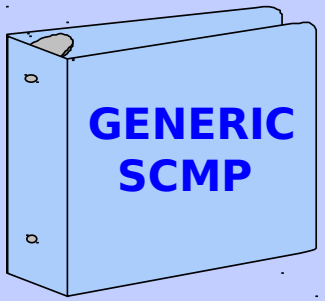
- **System Testers responsibilities:**
  - **Administer the Verification and Validation (V&V) testing prior to release of the software.**



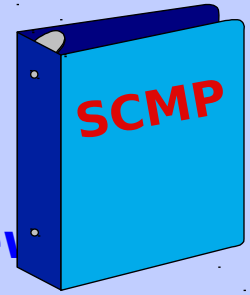
Role of Data Management (DM) in SCM

Responsibilities:

- **Oversees receipt, distribution, and tracking of technical data associated with the project.**
- **Ensures compliance with contract requirements as defined in the Contract Data Requirements List (CDRL).**



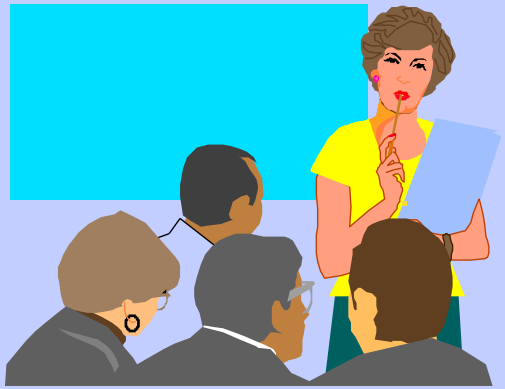
Get Approval of the SCMP



- Submit draft SCMP to project personnel for review
  - Use Formal Inspection Process
  - Ensure that project software, systems, SQA, and project management participate
- Incorporate reviewers comments
- Submit SCMP for final approval
- Place SCMP under Configuration Control
- Update SCMP to reflect current project requirements, processes and practices as required

Maintenance of the SCMP

- Review project SCM requirements due to growth or expansion of project functionality or interfaces to ensure coverage by the SCMP and Desk Top Procedures (DTPs)
- Consider impact of new or updated SCM tools
- Liaison with SEPO through Dept. SPI Agent to communicate or utilize newly identified “best practices”



Manage implementation of SCMP

- Identify the tasks to support the processes stated in the project SCMP
  - Develop a Work Breakdown Structure (WBS)
  - Quantify budget requirements for SCMP support (Guidelines)
    - » 2 to 4% of total program cost
    - » 6 to 8% of development cost
  - Review SCM tasks on previous programs and compare these costs with scope and complexity of the new or proposed program
- Determine and document the DTP (Desktop Procedures) required to support the processes stated in the SCMP
- Define the resources and positions required to implement the SCMP
- Monitor the accomplishment of each task
- Review tasks for compliance with the project SCMP

Document the SCM Desktop Procedures (DTP)

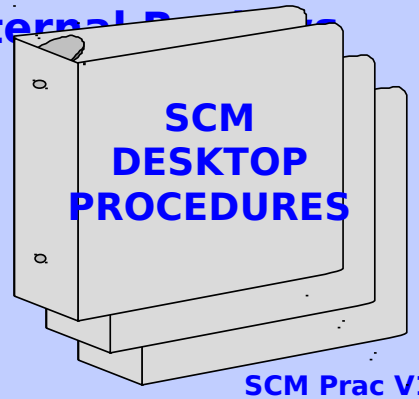
- A DTP is a step by step instruction describing a course of action to be taken to perform a given process
- Use Sample Desktop Procedure available from SEPO
- Recommended DTPs:

Configuration Identification (CI)
Configuration Status Accounting (CSA)
Corrective Action
Document Library (SDL)
Functional Config. Audit (FCA)
Software Config. Control Board (SCCB)
Board (SCRB)
Software Config. Management (SCM)
Software Release

Configuration Change Control
Configuration Audit
Data Management (DM)
Software Development Library

Physical Configuration Audit (PCA)
Software Config. Review

Internal
Training



Implementing the SCMP

- Identify and Manage resources
  - SCM Tools
  - Facilities
  - Funding
  - Non-developmental software

- Identify and Manage personnel
  - Personnel to perform SCM tasks
  - Training courses for those who perform the SCM tasks

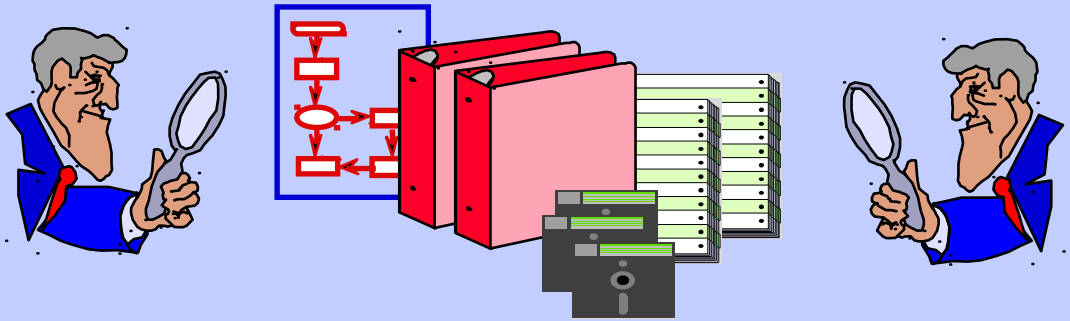
Provide SCM Training

Two types of training for SCM group and Software Team:

- **Overall SCM activities training (i.e. the training you are currently taking)**
  - **Use this training as a means for identifying specific project needs and developing appropriate SCM solutions**
- **Project specific SCM processes, DTP, SCM tools**

Perform Configuration Identification

- What does Configuration Identification involve?
  - Selection of Computer Software Configuration Items (CSCIs) and Software Units (SUs)
  - Determination of the types of configuration documentation required for each CSCI
  - Issuance of numbers and other identifiers affixed to CSCIs and to the technical documentation that defines the CSCI's configuration, including internal and external interfaces
  - Release of CSCIs and their associated configuration documentation
  - Establishment of configuration baselines for CSCIs

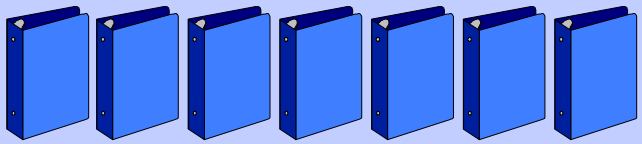


Configuration Identification (1 of 6)

- **Selecting Project CSCIs and SUs:**
  - **Responsibility of project management**
    - » **Based on System Hierarchy**
    - » **Identify documentation for CSCIs**
  - **Participation of SCM in CSCI selection desirable**
    - » **SCM provides inputs to ensure unique identifiers are assigned (e.g., apply file naming standards, etc.)**
  - **Identified CSCIs placed under CM according to project SCMP**

Configuration Identification (2 of 6)

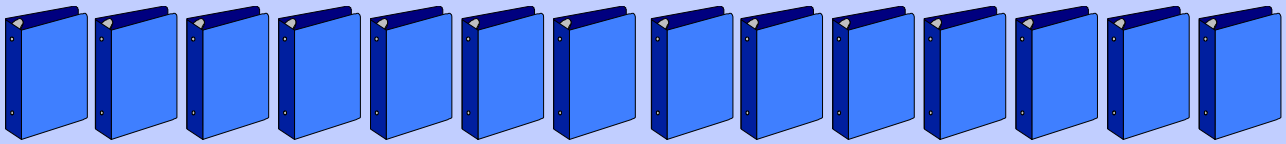
- **What types of configuration documentation are required for each CI (System), Program/Project, CSCI?:**
  - **<u>CI System Design</u>**
    System/Segment Design Document (SSDD)
    Interface Design Document (IDD)
    Database Design Description (DBDD)
  - **<u>Program/Project Planning</u>**
    Computer Resources Life Cycle Management Plan (CRLCMP)
    Software Development Plan (SDP)
    Software Test Plan (STP)
    Software Installation Plan (SIP)
    Software Configuration Management Plan (SCMP)
    Software Quality Assurance Plan (SQAP)



Configuration Identification (3 of 6)

- **What other types of configuration documentation are required for each CI (System), Program/Project, CSCI? :**

  - **CSCI Requirements**
    Software Requirements Specification (SRS)
    Interface Requirements Specification (IRS)
    Software Design Description (SDD)
    Interface Design Document (IDD)
    Data Base Design Document (DBDD)
    Software Test Description (STD)
    Software Test Report (STR)
    Software Version Description (SVD)
    Software User Manual (SUM)
    Software Input/Output Manual (SIOM)
    Software Center Operator Manual (SCOM)
    Computer Operator Manual (COM)
    Software Product Specification (SPS)



Configuration Identification (4 of 6)

- Issuance of numbers and other identifiers affixed to CSCIs and to the technical documentation that defines the CSCI's configuration, including internal and external interfaces :
  - Limit number of characters in identifiers to a maximum of 15
  - Assign identifiers to CSCIs and component parts and associated configuration documentation including:
    - » Revision and version numbers where appropriate
    - » Serial and lot numbers to establish effectivity
  - Ensure marking and labeling enables correlation between item, configuration documentation, and associated data
  - Ensure identifiers are embedded in source and object code and where contractually specified, electronically embedded in firmware.

MK50-SDD-S-RA-C0

COMPASS-SW-SOM-3.1.0

A7600-TAC13TP01

MK50-SRS-S-R0-C0

Configuration Identification (5 of 6)

Example 1: Document and Drawing Identifiers

Method:

SCM assigns unique identifier based on predefined naming conventions and numbering schemes. Each document or drawing page shows identification number and applicable revision number.

Examples:

"A7600-TAC13TP01"

A76 = CSCI Designator
00 = Revision Identifier (baseline version)
TAC13 = SU Designator by module acronym and serial number
TP = Document Type (Test Plan) or Drawing (DR)
01 = Volume Number (used only if multiple volumes)

"COMPASS-ICD-3.1A Ch Pg XX"

COMPASS = CSCI Designator
ICD = Document Type, or Drawing (DWG)
3.1A = Associated Version/Revision/Patch Identifier (3-1-A)
Ch Pg XX = Change Page Identifier

Configuration Identification (6 of 6)

Example 2: Software Identifiers

Method:

SCM identifies each CSCI and all project-developed support software required for development and maintenance with unique names, numbers, and version identifiers.

Examples:

"A76B4.01-TAC.ET"

A76 = CSCI Designator
B4 = Build Number
01 = Version of working build
TAC = SU Designator by module acronym
ET = Subordinate SU designator by function (where appropriate)

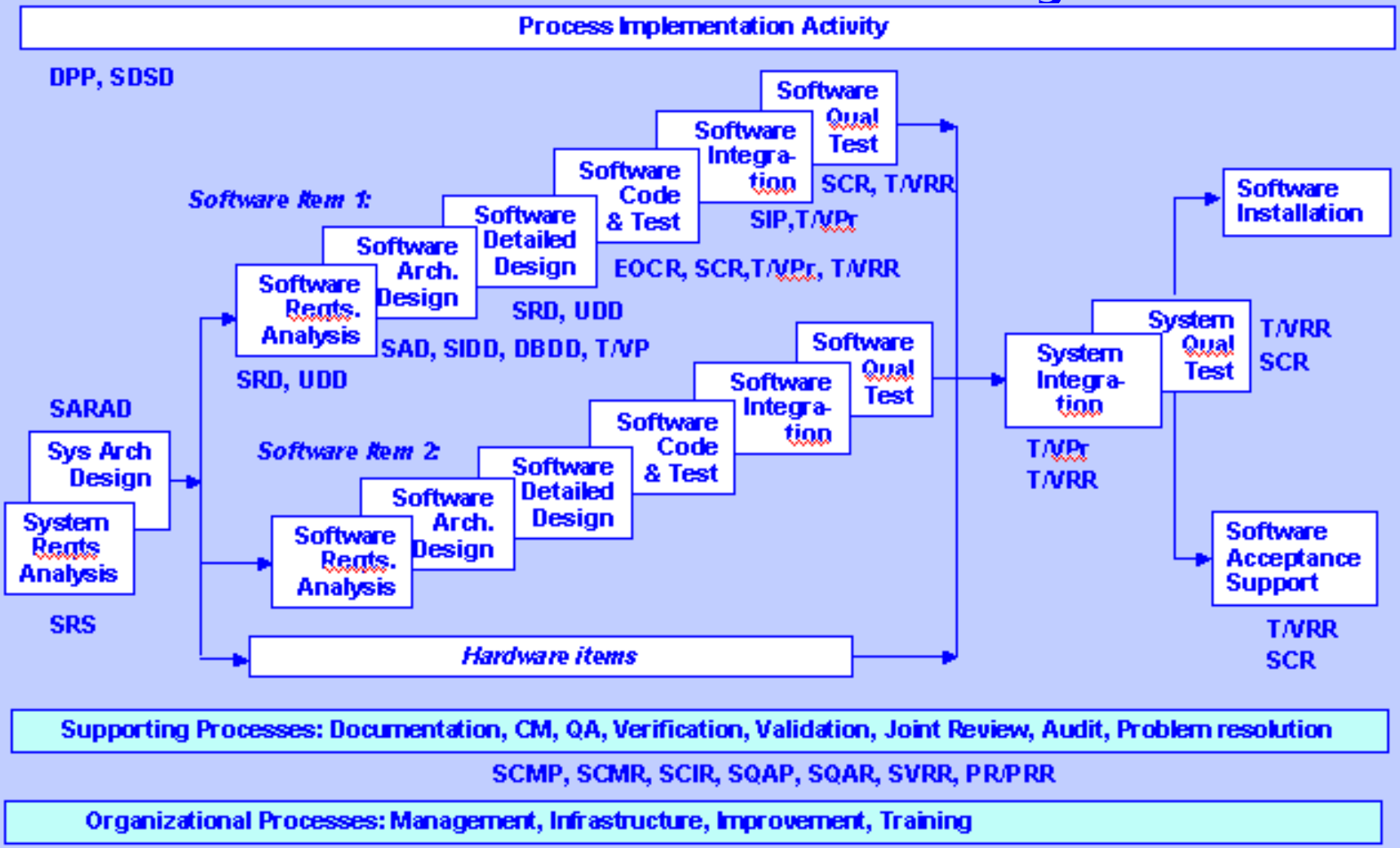
"COMPASS-SW-SOM-3.1.0"

COMPASS = CSCI Designator
SW = Software (SW) or Firmware (FW)
SOM = Software module Identifier (Scenario Operation Monitor)
3.1.0 = Version/Revision/Patch

KEY: USE THE APPROPRIATE NOMENTCLATURE AND BE CONSISTENT!

Configuration Identification – When to Do It

- Release of CSCIs & associated configuration



Establish Configuration Baselines to CSCIs

- Configuration Baselines are established based on the project's software development strategy

- Configuration baselines include (in order of appearance):
  - **Functional Baseline:** Documentation describing a system's or items functional, interoperability and interface characteristics and the verification used to demonstrate their achievement
  - **Allocated Baseline:** Documentation describing an item's functional, interoperability and interface characteristics, allocated from a higher-level configuration item
  - **Product Baseline:** Documentation describing all of the necessary functional and physical characteristics of the CI and the selected Functional and Physical characteristics designated for product acceptance testing and support

- Configuration software technical documentation, code, and media are formally designated and fixed at a specific time during a CSCIs life cycle

- Configuration baseline plus approved changes to that

Perform Configuration Control

A - Receive CSCI and technical data and place them in the libraries

- **Document/Drawing Library, Software Development Library**

B - Process CSCI and technical data requests

C - Establish a Configuration Control Board (CCB)

- **Support Change Control Process and provide Change Requests (CRs) to board members for evaluation**

D - Establish a Baseline Change Process

- **Document Chg. Requests, CCB Review/Accept/Prioritize, Record Disposition, support creation of new/revised Baseline**

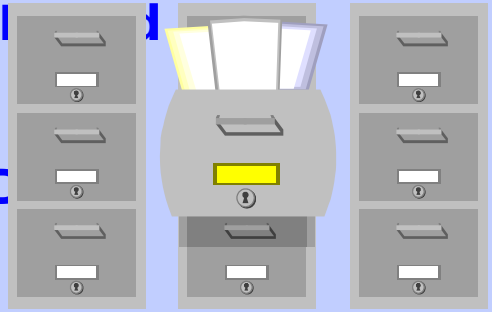
E - Identify change control documents and document procedures for creating and processing them

- **Identify form, document process(es) to generate and distribute/approve**

Configuration Control (1 of 12)

A - Receive CSCI and technical data and place them in the libraries

- CM Libraries are established to control documentation and create repositories containing CSCI



- Typically consist of three libraries:
  - » Software Development Library (SD
  - » Document Library
  - » Drawing Library

- The SDL comprises the controlled collection of documentation, intermediate software development products, associated tools, and procedures that comprise the Developmental Configuration CSCI

- The Document Library contains the hard copy and soft copy of approved baseline configuration documents (non-CSCI), deliverable/non-deliverable documents, and reference materials

- The Drawing Library comprises all project drawings (engineering, facility floorplans, design architecture, etc.)

Configuration Control (2 of 12)

B - Process CSCI and technical data requests

- Establish procedures for the controlled request and release of CSCIs, associated documentation, and other project-related artifacts

- Procedures will include maintaining “check-in/check-out” logs, reporting status of segments/modules/documents that are in development or change process and who is developing the changes

- If feasible, give strong consideration to the use of automated tools for assisting with controlling software/document access and overall configuration control (example: ClearCase, Merant Dimension, etc.)

Configuration Control (3 of 12)

C - Establish a Configuration Control Board (CCB)

- The CCB provides formally controlled changes to delivered product baseline documentation and software and for developmental products through performance of the following functions:

  - » Authorize establishment of software baselines and identification of CSCIs
  - » Represent interests of project management and all groups affected by software changes to the baseline
  - » Assign, review, and provide for disposition of action items
  - » Provide required staff coordination on all proposed or reviewed changes or modifications
  - » Serve as a source for the coordination of software technical [illegible] for the project.

Configuration Control (4 of 12)

C - Establish a Configuration Control Board (CCB) (cont'd)

- »Identify resources required for implementation of proposed changes
  - assess impact of proposed changes upon the system
  - determine cost of proposed changes
  - determine impact of changes on development and test schedules
- » Monitor design, production, and validation process for approved modifications; initiate corrective action process to ensure design compatibility and integrity, cost-effectiveness, and conformance to scheduled milestones.
- » Direct implementation of changes approved by the SCCB (the Local Software CCB - probably YOUR CCB)

Configuration Control (5 of 12)

C - Establish a Configuration Control Board (CCB) (cont'd)

» Exercise interface management support and control for project software.

» Exercise approval authority (project-level)

- Recommend approval for Class I changes

  Class I changes affect: operational characteristics, performance, weight, interfaces, or other technical requirements in the specification

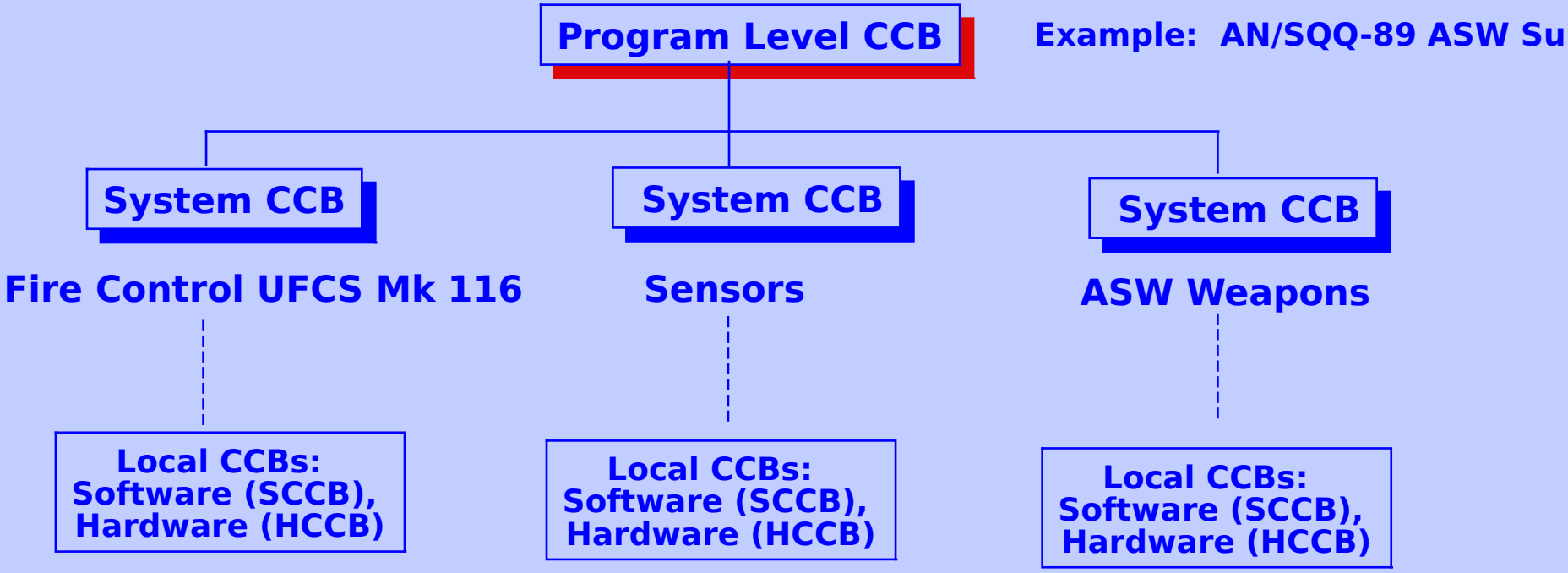
- Approve Class II changes

  Class II changes have no operational effects; and are transparent to the user

Configuration Control (6 of 12)

C - Establish a Configuration Control Board (CCB) - (cont'd)

- "Layered" CCBs will be required to ensure coordinated CM of multiple integrated systems

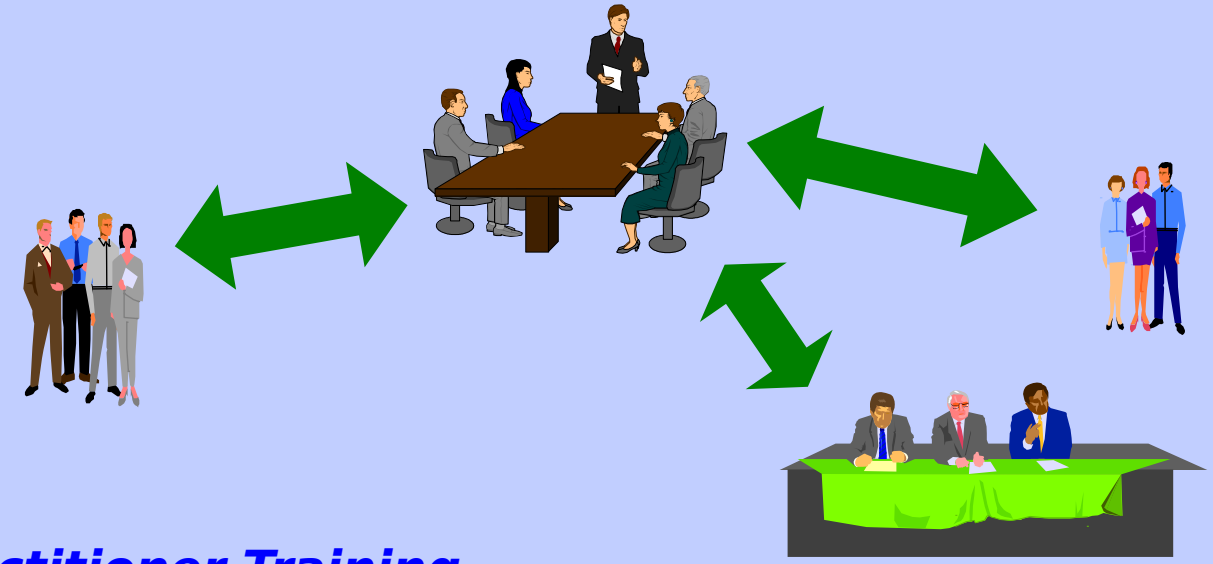


Configuration Control (7 of 12)

C - Establish a Configuration Control Board (CCB) - (cont'd)

- CCBs may interface with other technical control boards as appropriate:

  - »Technical Review Board (TRB)
  - » Operational Advisory Group (OAG)
  - » Maintenance Advisory Group (MAG)
  - » Interface Control Working Group (ICWG)



Configuration Control (8 of 12)

D - Implement a Baseline Change Process

- Prepare and Submit the change request

- CCB and SCCB review (justify, evaluate and coordinate)

» Assign priorities - MIL-STD-498 provides detailed descriptions for priorities:

Priority 1: Prevents the accomplishment of an operational or mission essential capability

Priority 2: Mission degrade with no work-around

Priority 3: Mission degrade with workaround

Priority 4: Minor

Priority 5: Other

» Classify problem/enhancement categories (affects plans, concept, requirements, design, code, database/data file, test info, manuals, other)

- CCB and SCCB disposition (approve, disapprove, defer, etc.)

» CCB approves Class I changes

Configuration Control (9 of 12)

D - Implement a Baseline Change Process (cont'd)

» SCCB recommends approval of Class I changes, SCCB approves Class II changes

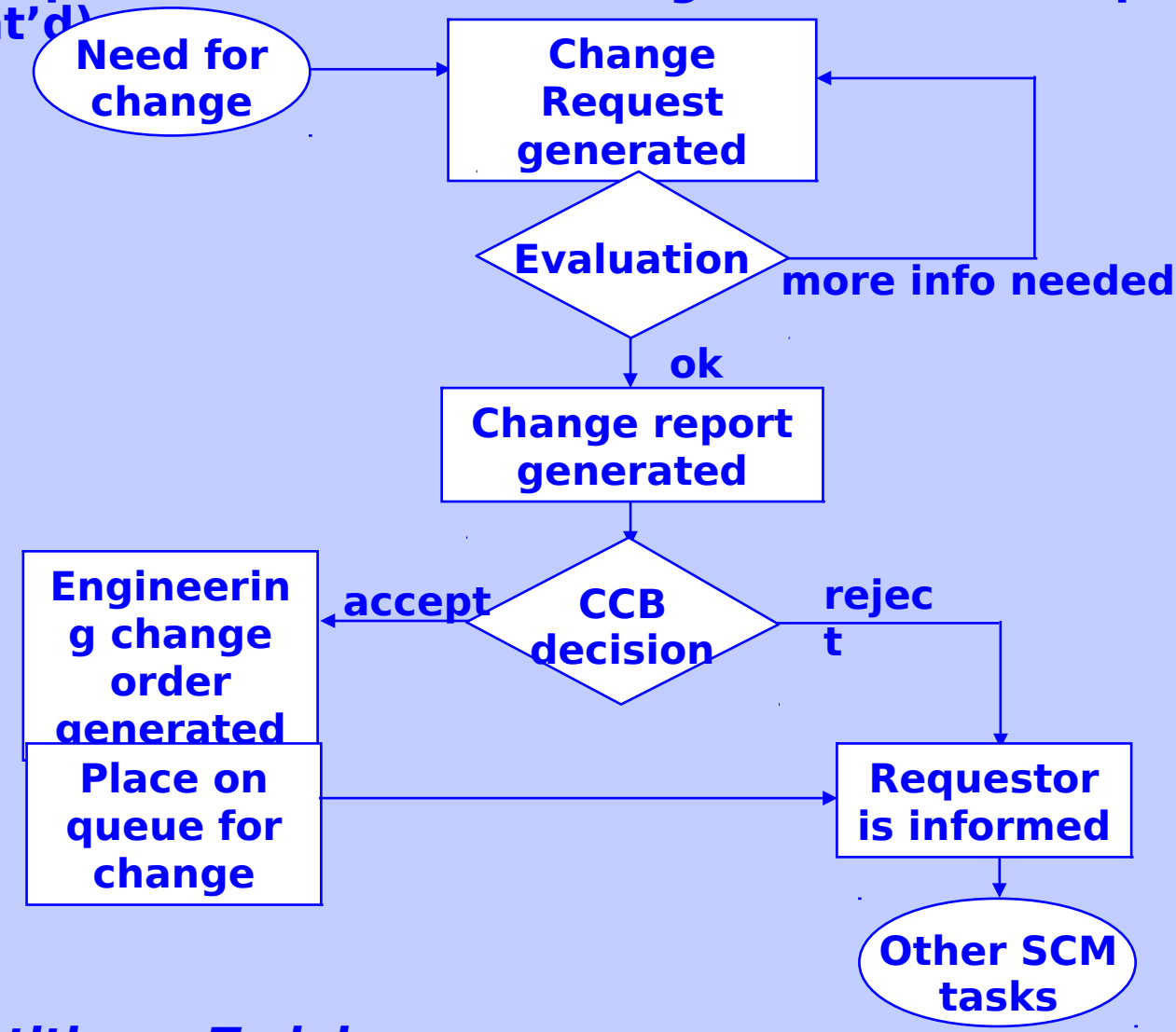
» CM takes minutes of CCB meetings and archives them in the project SDL

- System/Software Engineering Implementation of the approved change to software and documentation

- CCB and SCCB approves baseline and approves baseline release

Configuration Control (10 of 12)

D - Implement a Baseline Change Process (Example) (cont'd)



Configuration Control (11 of 12)

E - Identify change control documents and document procedures for creating and processing them

- Project may use some or all of the following change request forms. Refer to the Generic SCMP and MIL-STD-973 for a description of these forms and their processing:

- **Engineering Change Proposal**
- **Specification Change Notice**
- **Notice of Revision**
- **Deviation and Waiver**
- **Local Change Request**

Perform Configuration Control (12 of 12)

F – Report any deficiencies against this activity or suggested enhancements

- **SCM work with SQA to review SCM processes and products to determine whether goals and objectives for effective CM control are being met**

- **When appropriate document process changes to SCMP via Document Change Requests (DCRs) to recommend improvements in the SCM process; coordinate planned SCMP changes with your Department SPI to ensure consistency with organization process (suggest improvements to the organization process if appropriate!)**

Perform Configuration Status Accounting

A - Establish/Maintain CSA system

B - Receive CSCI and technical data for entry into the CSA system

C - Generate CSA reports

D - Report any deficiencies against this activity

Configuration Status Accounting (1 of 9)

A- Establish/Maintain CSA system

» Document a Data Base design to identify the elements that will comprise the CSA (e.g. Configuration Identifier, Description, Change Status, Location(s), Current/Archived Baseline Version(s), etc.). MIL-STD-973, Appendix H provides suggested CSA requirements and records, Appendix I provides a recommended standard set of CSA elements

» Establish MINIMUM Data Entry requirements to establish a CI record in the CSA system

» Consider acquiring an automated CSA data base tool

» Maintain control conventions for access to and update of CSA contents

Configuration Status Accounting (2 of 9)

B – Receive CSCI and technical data for entry into the CSA system

» **Establish the technical data necessary to update the CSA system**

Example (Required Data Elements for a Software Trouble Report):

- Date (date format)
- Category-**S**oftware, **D**esign, **E**ngineering, **L**ogic, **O**ther (1-character field)
- Priority-1 thru 5 (1-digit numeric field)
- STR # (numeric field, Auto generation, starting with 1)
- STR title (alpha-numeric field, 55 characters max)
- Originator (20-character field)
- Activity/Code (alpha-numberic character field, 40 characters max)
- Telephone/Ext. (alpha-numeric field, 20 characters max)
- Status (table field)

» **Accomplish the initial data entry and maintain current**

Configuration Status Accounting (3 of 9)

C – Generate CSA Reports. These reports should include:

» Identification of currently approved configuration documentation and configuration identifiers associated with each CSCI

» Status of proposed change requests from initiation to implementation.

» Results of configuration audits; status and disposition of discrepancies

» Traceability of changes from baseline documentation of each CSCI

» Effectivity and installation status of configuration changes to all CSCIs at all locations.

Configuration Status Accounting (4 of 9)

C – Generate CSA Reports. (sample reports)

Record of Approved Configuration Documentation and ID Numbers

Doc identifier	Document Title	Doc date	Status	Lib Location
MK50-SRS-S-R0-C0	Torpedo MK50 Software Requirements Specification	4/6/95	Approved SCCB 4/6/95	Safe 12345
MK50-SDD-S-RA-C0	Torpedo MK50 Software Design Specification	9/1/95	Approved SCCB 9/15/95	Safe 12345
MK50-SDP-U-R0-C0	Torpedo MK50 Software Development Plan	12/5/94	Approved SCCB 1/5/96	File Drwr 3
MK50-SQAP-U-R0-C0	Torpedo MK50 Software Quality Assurance Plan	12/13/94	Approved SCCB 1/20/96	File Drwr 3

Configuration Status Accounting (5 of 9)

C – Generate CSA Reports. (sample reports)

Status of proposed changes, deviations, and waivers to the configuration

STR #	CCD	PRI	CAT	Title	Date	Status	Implemented
45	STR	1	S	Fix 5 degree pitch offset	12/5/01	Approved - SCCB 12/10/01	Version 1.3
66	STR	1	S	Add Full Power transmits	12/6/01	Approved - SCCB 12/10/01	Version 1.3
71	STR	3	L	Change detect loop	1/2/02	Open	
72	STR	5	D	Threshold Change	2/13/02	Open	

Configuration Status Accounting (6 of 9)

C – Generate CSA Reports. (sample reports)

Implementation status of approved changes

Tracking #	CCD	Title	Date	Proposed Implementation	Implemented
249	SCP	Highlight Selected MTU/CMTU Track for Tape assignment	7/7/92	Version M	Version M
337	SCP	Provide a Reconfigurable Module(s) Lost Advisory	7/9/92	Version M	Version M
379	SCP	Provide insufficient TDS Track Numbers Advisory	7/10/92	Version M	Version M
384	SCP	Display Unique Symbol for Direct Interfacing Unit	7/10/92	Version M	Version M
391	SCP	Provide TADIL-B Link Status Data in Maintenance Mode	7/14/92	Version M	Version M

Configuration Status Accounting (7 of 9)

C – Generate CSA Reports. (sample reports)

Product Baseline for Release Version 1.3

Tracking #	CCD	Title	Date	Status	Imple-mented
45	STR	Fix 5 degree pitch offset	12/5/01	Approved -	Version 1.3
66	STR	Add Full Power transmits	12/6/01	Approved	Version 1.3
71	STR	Change detect loop	1/2/02	Open	
72	STR	Threshold Change	2/13/02	Open	

Configuration Status Accounting (8 of 9)

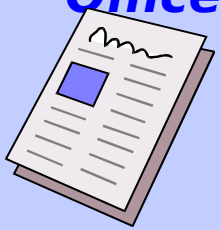
C - Generate CSA Reports: Field Requests for CSA Repo

» Requests for CSA reports originating outside the project are directed for approval to Project Management which authorizes need-to-know access

» SCM should provide on a periodic basis or allow access to CSA Reports to all members of the project

» SCM maintains the CSA Report Distribution list

Configuration Status Accounting (9 of 9)



C – Generate CSA Reports: Field Requests for CSA Reports. (cont'd)

Document	Distribution List	COPY #	Special Instructions
MK50-SRS-S-RA-C0	Last, First Name, Naval Activity, Code, City, State,	5	Mailroom
	Last, First Name, Naval Activity, Code, City, State,	6	Mailroom
	Last, First Name, Naval Activity, Code, City, State,	7	Mailroom
	Last, First Name, Naval Activity, Code, City, State,	8	Mailroom
MK50-SDP-U-R0-C0	Green, G., SSC Code XXXX	15	
	Blue, B., SSC Code XXXX	16	
	Brown, B., SSC Code XXXX	17	

Perform Configuration Audits and Reviews

- Formal Audit Types

» **Functional Configuration Audit (FCA)**

The formal examination of functional characteristics of a configuration item, prior to acceptance, to verify that the item has achieved the requirements specified in its functional and allocated configuration documentation. Functional Characteristics are quantitative performance parameters and design constraints, including operational and logistic parameters and their respective tolerances. Functional characteristics include all performance parameters, such as range, lethality, reliability, maintainability, and safety.

» **Physical Configuration Audit (PCA)**

The formal examination of the "as built" configuration of a configuration item against its technical documentation to establish or verify the configuration item's product baseline.

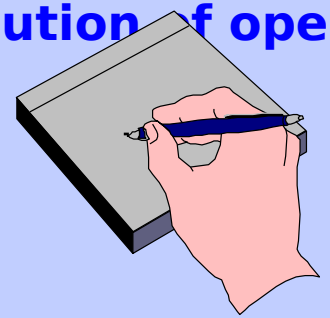
» **FCAs and PCAs are described in MIL-STD-973**

Configuration Audits and Reviews

- CM support for configuration audits:
  - » Assist in the audit
  - » Review audit checklist
  - » Prepare SCM reports, logs or records required to support the audit
  - » Establish and maintain baseline specifications and product files
  - » Follow up on audit reports to assess possible SCM impact
  - » Provide storage for audit documentation, records and products
  - » Ensure audit report action items are resolved

Configuration Audits and Reviews

- Required Plan documentation to conduct FCA/PCA:
  - » An FCA/PCA Plan is written to:
    - » Identify the specific tasks and procedures to accomplish these audits
    - » Identify the documents, hardware, software and test sets required for performing the audits and what is to be examined
  - » The resulting FCA/PCA Report:
    - » Reports the results of the audit findings
    - » Requires resolution of open issues or action items



Configuration Audits and Reviews

- Typical Scheduling of FCA/PCA:
  - » FCA:
    - » After a major change or significant numbers of minor changes have occurred or before the establishment of the Product Baseline
  - » PCA:
    - » Concurrently with the FCA or immediately following an FCA

NOTE: IF the project maintains effective CM control, the FCA/PCA should be a SLAM DUNK!

Configuration Audits and Reviews

- Other periodic informal CM audits:

  » Performed as deemed appropriate by the project manager

  » SCM Audits. Independent audit of SCM processes, procedures, and products to ensure that the SCM program complies with the requirements of the SCMP

  » SCM Reviews. Internal review to determine how effectively and efficiently the SCM process and procedures fulfill the SCM requirements as defined in the SCMP. Includes verification of products generated by SCM

  » SQA typically conducts or assists with both formal and informal audits

Configuration Audits and Reviews

- Documentation from formal and informal CM audits (SCM Deficiency Report):

  - » Identify noncompliance with SCM processes, procedures, and products against requirements of the SCMP

  - » Identify areas for improving effectiveness and efficiency in SCM processes and procedures

  - » Provide results of verifying products generated by SCM (e.g., status reports, change requests forms, etc.)

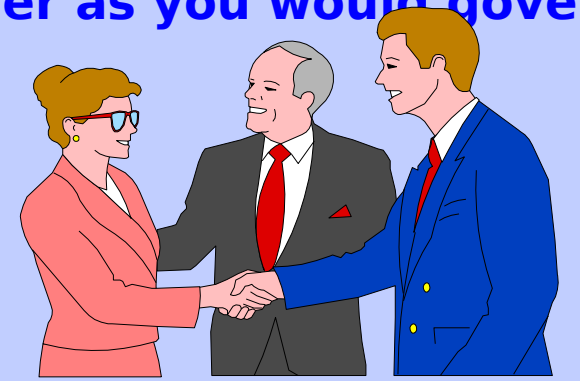
Implementing SCM: Subcontractor Support

- Should your project's Configuration Management function be partially or completely subcontractor supported:

  » Use these same guidelines to establish subcontractor performance requirements

  » Employ Government CM/SQA representation to verify compliance of subcontractor activities with SCM plans and procedures

  » Document and resolve discrepancies in performance in the same manner as you would government personnel-supported SCM



Implementing SCM: Applying the SCM Process
Conclusion

Sound Configuration Management is an essential element of every well-managed software project.

Thank you for your participation in this training class!

ANY QUE S?